

## Effect of agronomic factors on nutrient content and uptake, dry matter accumulation and yield of chickpea (*Cicer arietinum*) on farm conditions

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### ABSTRACT

A field experiment was conducted during rabi season of 1994-95 in rainfed area of Kangra district of Himachal Pradesh to study the effect of agronomic factors on nutrient content and uptake, dry matter accumulation and yield of chickpea under on-farm conditions. Varieties C-235 and PBG-1 remaining statistically at par recorded significantly higher N, P and K uptake, protein content, and grain and straw yield than HPG-17 variety. Delay in sowing from October 2 to October 17 caused significant reduction in N, P and K uptake, and protein content in grains, but grain and straw yield did not vary significantly due to delayed sowing. Phosphorus levels also affected significantly the uptake of nutrients, protein content in grains and yield. Significant increase in total uptake of N, P and K, protein content, and grain and straw yield due phosphorus application was upto 40 kg P<sub>2</sub>O<sub>5</sub>/ ha only.

**Key words :** Chickpea varieties, Sowing dates, Phosphorus, Nutrient content, Uptake, Protein content, Yield.

### INTRODUCTION

Chickpea (*Cicer arietinum*) is one of the most important pulse crops in the World. India accounts for 36 per cent of total chickpea area and production of the world. In the country, it is cultivated over an area of 7 million ha, with a production of 6.12 million tones (Meena *et al.*, 2002). Thus, it has significant contribution to country's pulse production, accounting for 30.1 per cent of the total area and 38.5 per cent production of pulses (Asthana and Mishra, 1999). Obviously, it plays a vital role in agricultural economy of India. Moreover, it forms an important source of proteins (21 per cent) and minerals like, calcium, iron and niacin in Indian daily diet. The yield potential and quality of produce of crops are largely influenced by the availability and uptake of nutrients; crop absorbing enough of nutrients to meet out its requirement is expected to yield higher and exhibit better protein content in produce than the one absorbing less nutrients. As availability and uptake of nutrients by crop are influenced by agronomic factors, an on-farm field experiment was conducted to find out the effects of varieties, sowing dates and phosphorus application on nutrient content, nutrient uptake, protein content in grains, dry matter accumulation and yield of chickpea.

### MATERIALS AND METHODS

An on-farm experiment was carried out at Darkata

village, Tehsil Dehra, District Kangra (Himachal Pradesh) during *rabi*, 1994-95 under rainfed conditions. The experiment comprised of 18 treatments, and it was laid out in split -plot design replicated thrice keeping combination of three varieties (C-235, HPG-17 and PBG-1) and two sowing dates (October 2 and October 17) in main-plots and three phosphorus levels in sub-plots. The experimental site was situated at an elevation of 532 m above mean sea level and falls under the sub-mountain and low-hills subtropical zone of Himachal Pradesh. Soil of the experimental field was sandy loam in texture (sand 49.2 %, silt 32.78 % and clay 17.93%) neutral in reaction (pH 6.5), high in organic carbon (1.23 %) and medium in available Nitrogen (394.2 kg/ha), phosphorous (18.8 kg P<sub>2</sub>O<sub>5</sub>/ha), potassium (128.4 kg K<sub>2</sub>O/ha). A total of 346 mm rainfall was received during the entire crop period. All the management practices except the treatments were followed as per farmer's practice. Nitrogen concentration in grain and straw was estimated by modified Kjeldahl method (Jackson, 1967), phosphorous by vanadomolybdate phosphoric acid yellow colour method ((Jackson, 1967) and potassium by flame emission spectro photometer method (Jackson, 1967). The protein content in grains was determined by multiplying its nitrogen content by the factor 6.25 (A.O.A.C., 1990).